

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

- 1 1. (currently amended) A data management method, comprising:
2 using an operating system, operating a source volume of a source device wherein
3 the source volume includes storage, a plurality of user files stored in said storage and a
4 file system for locating said user files stored in said storage, said file system including an
5 address table identifying the location of each file on said storage device, said operating
6 including said operating system locating said user files in said storage using said file
7 system and said address table of said file system;
8 backing up contents of ~~a~~ the source volume of the source device at a first client
9 station as at least one object of a database stored in a data storage subsystem wherein the
10 at least one object represents an image of the contents of the source volume of the source
11 device ~~and wherein the image of the contents of the source device includes a plurality of~~
12 ~~files and a file directory of the source device;~~
13 using the database, tracking attributes and location of the at least one object in the
14 database;
15 using the at least one object, restoring the contents of the source volume of the
16 source device from the at least one object to at least one record of a target file in a file
17 system stored on a storage device instead of to a volume being operated as a volume by
18 an operating system so that the at least one record of the target file contains internally
19 within said at least one record of said target file, image data representing said contents of
20 the source volume device including image data representing both said plurality of files
21 and said file system directory of the source volume within said at least one record of said
22 target file device wherein said file system comprises a plurality of files and an address
23 table identifying the location of each file on said storage device;

24 using an operating system, using the target file containing the image data as a file
25 instead of a volume so that the target file is not operated as a volume by an operating
26 system; and

27 copying image data representing the restored contents of the source volume device
28 from the at least one record of the target file to a target volume of a target device so that
29 the target volume device contains the restored contents of the source volume device
30 including said plurality of files of the source volume device and said file system directory
31 of the source volume device; and

32 using an operating system, operating the target volume as a volume, including
33 locating said user files in said target volume using said file system of said target volume
34 so that the target volume is operated as a volume instead of a file by an operating system.

1 2. (previously presented) The method of claim 1 wherein the target file is stored
2 on storage media at a second client station.

1 3. (currently amended) The method of claim 1 wherein the target file is a flat file
2 which contains in a single record of the flat file the image data representing the complete
3 contents of the source volume device.

1 4. (cancelled)

1 5. (original) The method of claim 1 wherein the data storage subsystem includes
2 a server coupled to the first client station by a network.

1 6. (original) The method of claim 1 further comprising, using the at least one
2 object, restoring the contents of the source device from the at least one object to a target
3 device so that the target device contains the contents of the source device.

1 7-9. (cancelled)

1 10. (original) The method of claim 1 further comprising mounting the source
2 device as a read only device wherein write operations to said source device are prevented
3 during said backing up of said source device.

1 11. (previously presented) The method of claim 1 wherein said target file is a flat
2 file.

1 12. (original) The method of claim 1 wherein said copying uses the UNIX dd
2 command.

1 13-36. (cancelled)

1 37. (currently amended) An article of manufacture for data management,
2 wherein the article of manufacture causes operations to be performed, the operations
3 comprising:

4 using an operating system, operating a source volume of a source device wherein
5 the source volume includes storage, a plurality of user files stored in said storage and a
6 file system for locating said user files stored in said storage, said file system including an
7 address table identifying the location of each file on said storage device, said operating
8 including said operating system locating said user files in said storage using said file
9 system and said address table of said file system;

10 backing up contents of ~~a the source volume of the source device~~ at a first client
11 station as at least one object of a database stored in a data storage subsystem wherein the
12 at least one object represents an image of the contents of ~~the source volume of the source~~
13 ~~device and wherein the image of the contents of the source device includes a plurality of~~
14 ~~files and a file directory of the source device;~~

15 using the database, tracking attributes and location of the at least one object in the
16 database;

17 using the at least one object, restoring the contents of the source volume of the source device from the at least one object to at least one record of a target file in a file system stored on a storage device instead of to a volume being operated as a volume by an operating system so that the at least one record of the target file contains internally within said target file, image data representing said contents of the source volume device including image data representing both said plurality of files and said file system directory of the source volume within said at least one record of said target file device, said file system comprising a plurality of files and an address table identifying the location of each file on said storage device;

26 using an operating system, using the target file as a file instead of a volume so that the target file is not operated as a volume by an operating system; and

28 copying image data representing the restored contents of the source volume device from the at least one record of the target file to a target volume of a target device so that the target volume device contains the restored contents of the source volume device including said plurality of files of the source volume device and said file system directory of the source volume device; and

33 using an operating system, operating the target volume as a volume, including using said operating system, locating said user files in said target volume using said file system of said target volume so that the target volume is operated as a volume instead of a file by an operating system.

1 38. (previously presented) The article of manufacture of claim 37 wherein the
2 target file is stored on storage media at a second client station.

1 39. (currently amended) The article of manufacture of claim 37 wherein the
2 target file is a flat file which contains in a single record of the flat file the image data
3 representing the complete contents of the source device.

1 40. (previously presented) The article of manufacture of claim 37 wherein the
2 data storage subsystem includes a server coupled to the first client station by a network.

1 41. (previously presented) The article of manufacture of claim 37 wherein the
2 operations further comprise:

3 using the at least one object, restoring the contents of the source device from the at
4 least one object to a target device so that the target device contains the contents of the
5 source device.

1 42-44. (cancelled)

1 45. (previously presented) The article of manufacture of claim 37 wherein the
2 operations further comprise:

3 mounting the source device as a read only device wherein write operations to said
4 source device are prevented during said backing up of said source device.

1 46. (previously presented) The article of manufacture of claim 37 wherein said
2 target file is a flat file.

1 47. (previously presented) The article of manufacture of claim 37 wherein said
2 copying uses the UNIX dd command.

1 48. (currently amended) A subsystem for managing data for use with a plurality
2 of client stations coupled together by a network, said client stations including a source

3 client station having a source device and a target client station having a target device,
4 each source device having a source volume which includes storage, a plurality of user
5 files stored in said storage and a file system for locating said user files stored in said
6 storage, said file system including an address table identifying the location of each file on
7 said storage device storing a file system comprising a plurality of files and an address
8 table identifying the location of each of said plurality of files, comprising:
9 a data storage device having a database comprising a plurality of objects;
10 a digital data processing apparatus coupled to the storage device, wherein the
11 digital data processing apparatus includes an operating system and is programmed to
12 perform ~~a~~ data management ~~method~~ operations, said ~~method~~ operations comprising:
13 using the operating system, operating a source volume of a source device
14 including said operating system locating said user files in said storage using said
15 file system and said address table of said file system;
16
17 backing up contents of ~~a~~ the source volume of the source device at a source
18 client station as at least one object of said database stored in said data storage
19 device wherein the at least one object represents an image of the contents of the
20 source volume of the source device and wherein the image of the contents of the
21 source device includes a plurality of files and a file directory of the source device;
22 using the database, tracking attributes and location of the at least one
23 object in the database;
24 using the at least one object, restoring the contents of the source volume of
25 the source device from the at least one object to at least one record of a target file
26 in said file system stored on a target device of a target client station instead of to a
27 volume being operated as a volume by an operating system so that the target file
28 contains internally within said at least one record of said target file, image data
29 representing said contents of the source volume device including image data

30 representing both said plurality of files and said file system directory of the source
31 volume within said at least one record of said target file device;
32 using an operating system, using the target file as a file instead of a
33 volume so that the target file is not operated as a volume by an operating system;
34 and
35 copying image data representing the restored contents of the source
36 volume device from the at least one record of the target file to a target volume of
37 a target device of a target client station so that the target volume client station
38 contains the restored contents of the source volume device including said plurality
39 of files of the source volume device and said file system directory of the source
40 volume device; and
41 using an operating system, operating the target volume as a volume,
42 including using said operating system, locating said user files in said target
43 volume using said file system of said target volume so that the target volume is
44 operated as a volume instead of a file by an operating system.

1 49. (previously presented) The subsystem of claim 48 wherein the target file is
2 stored on a target device of a target client station different from said source client station.

1 50. (currently amended) The subsystem of claim 48 wherein the target file is a
2 flat file which contains in a single record of the flat file the image data representing the
3 complete contents of the source volume device.

1 51. (previously presented) The subsystem of claim 48 wherein the digital data
2 processing apparatus includes a server coupled to the first client station by said network.

1 52. (currently amended) The subsystem of claim 48 wherein said operations
2 method further comprise comprises:

3 further comprising, using the at least one object, restoring the contents of the
4 source device from the at least one object to a target device so that the target device
5 contains the contents of the source device.

1 53-55. (cancelled)

1 56. (currently amended) The subsystem of claim 48 wherein said operations
2 ~~method~~ further comprise ~~comprises~~:

3 mounting the source device as a read only device wherein write operations to said
4 source device are prevented during said backing up of said source device.

1 57. (previously presented) The subsystem of claim 48 wherein said target file is a
2 flat file.

1 58. (previously presented) The subsystem of claim 48 wherein said copying
2 uses the UNIX dd command.

1 59. (currently amended) A data management method, comprising:
2 using an operating system, operating a source volume of a source device wherein
3 the source volume includes storage, a plurality of user files stored in said storage and a
4 file system for locating said user files stored in said storage, said file system including an
5 address table identifying the location of each file on said storage device, said operating
6 including said operating system locating said user files in said storage using said file
7 system and said address table of said file system;

8 mounting ~~a~~ the source device as a read only device wherein write operations to
9 said source device are prevented during backing up of said source device;

10 backing up the complete contents of said the source volume of the source device
11 at a first client station as at least one object of a database stored in a data storage
12 subsystem which includes a server coupled to the first client station by a network wherein

13 the at least one object represents an image of the contents of the source volume of the
14 ~~source device and wherein the image of the complete contents of the source device~~
15 ~~includes a plurality of files and a file directory of the source device;~~
16 using the database, tracking attributes and location of the at least one object in the
17 database;
18 determining that a target device is not available;
19 in response to said determination that said target device is not available, using the
20 at least one object, restoring the contents of the source volume of the source device from
21 the at least one object to a single record of a flat target file in a file system stored on a
22 storage device at a second client station instead of to a volume being operated as a
23 volume by an operating system so that the single record of the flat target file contains
24 internally within said single record of the flat target file, image data representing said
25 complete contents of the source volume device including image data representing both
26 said plurality of files and said file system directory of the source volume device within
27 the contents of the single record of the flat target file, ~~wherein said file system~~
28 ~~comprises a plurality of files and an address table identifying the location of each file on~~
29 ~~said storage device~~;
30 using an operating system, using the flat target file as a file instead of a volume so
31 that the flat target file is not operated as a volume by an operating system; and
32 copying image data representing the ~~restored~~ complete contents of the source
33 volume device from the single record of the flat target file using the UNIX dd command
34 to a target volume of said target device when available so that the target volume device
35 contains the complete restored contents of the source volume device including said
36 plurality of files of the source volume device and said file system directory of the source
37 volume device; and
38 using an operating system, operating the target volume as a volume, including
39 using said operating system, locating said user files in said target volume using said file

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40 system of said target volume so that the target volume is operated as a volume instead of
41 a file by an operating system.